Hecla
MINING COMPANY

March 8, 2001



Ms. Janice Pearson
U.S. Environmental Protection Agency
Region VIII
Office of Enforcement, Compliance
and Environmental Justice
999 18th Street, Suite 500, 8ENF-T
Denver, CO 80202-2466

**RE: Response to Issues Discussed During February 22, 2001 Conference Call**

Dear Ms Pearson:

This letter is in response and a follow-up to the conference call held on February 22, 2001 between the EPA and Hecla Mining Company (Hecla). During the call, several issues pertaining to the Sampling and Analysis Work Plan (Work Plan) for Pond 2 at the Apex Site were discussed. At the conclusion of the call, it was agreed that Hecla would respond to the remaining issues by March 8, 2001.

Since the conference call, Hecla has had the opportunity to meet internally on the issues regarding the Work Plan. Hecla is responding to the issues discussed during the call, and providing assessments for each item. Since Hecla is making certain suggestions within this letter, a revised version of the Work Plan is not included. However, Hecla is prepared to complete the Work Plan update upon EPA's approval and agreement to the recommended responses that follow. Hecla is hopeful the EPA finds these assessments satisfactory, and is prepared to proceed with the Work Plan efforts.

There are four outstanding issues addressed in this letter, pursuant to the conference call. They consist of the following topics: 1) monitoring well plan, 2) ecological risk assessment plan, 3) "other" metals, and 4) background groundwater quality data. Each issue is addressed below.

1) Monitoring Well Plan

The EPA requested a monitoring well plan be incorporated into the Work Plan. During the February 22, 2001 conference call, EPA hydrogeologist Randy Breeden recommended a minimum of seven down-gradient monitoring wells be installed. This recommendation was based on a hydrogeologic model incorporating several subjective EPA derived assumptions.

Hecla has discussed this issue in detail with our consultant, Shepherd Miller Incorporated (SMI), and believe that the criteria utilized in the EPA hydrogeologic model should be reviewed further and amended. It is Hecla's opinion that the variables discussed during the call and incorporated into the model could be optimized to better reflect the actual conditions at the site. At Hecla's request, Clint Strachan at SMI wrote a short memorandum detailing the specific criteria in question. This memorandum is attached for your review, as Attachment A. Hecla feels the criteria stated in the memorandum more accurately reflects on-site

conditions and should support a fair interpretation and subsequent reduction in the number of down-gradient wells required to properly investigate the Site. Hecla would appreciate the EPA reviewing this information and applying these variable adjustments to the model.

2) Ecological Risk Assessment Plan

The EPA requested that a screening-level ecological risk assessment plan be incorporated into the Work Plan. This plan would require that Steps 1 and 2 of the Superfund Ecological Risk Assessment Plan be performed to ascertain the risk level associated with the site.

Hecla rationalizes that the need for the ecological risk assessment plan is premature, and recommends this be delayed until the analytical results from the current Work Plan have been received and reviewed. A decision as to the importance or need for the risk assessment could then be made based on current representative data.

3) "Other" Metals

The EPA requested that a historical review of additional, non-reportable metals be performed to substantiate the position these metals do not require inclusion into the Work Plan analysis package. These metals included antimony, beryllium, thallium, tin, and vanadium.

A review of historical data provided limited, but consistent results showing very minimal or non-detectable amounts for the metals in question. Analytical information was found in varying amounts for every metal but tin, and the results are included for your review. Please see Attachment B. Based on this supporting data, and the fact these metals are not reportable according to the requirements of the Order, it is Hecla's contention these metals should not be included in the analysis parameters of the Work Plan.

4) Groundwater Quality Data

The EPA requested information pertaining to the location of existing groundwater quality data. Clint Strachan reviewed the information available on this subject, and has written a memorandum discussing information that has already been provided to the EPA. This memorandum is provided as Attachment C. Hecla feels this information adequately addresses this issue and no further comment is required.

Hecla has pursued updating the Sampling and Analysis Work Plan, based on the changes and agreements made since the September 18, 2000 version submittal. Hecla will incorporate these last remaining issues into the Work Plan once we have come to an agreement.

Note: In preparation for the implementation of the Work Plan, a review of our flies revealed that we do not have the two attachments mentioned in the 3013 Order documentation dated September 22, 1999. These attachments consist of the following

documents: 1) EPA Region VIII Field Sampling Guide, and 2) QAR5. At your convenience, will you please send us copies of each document?

We look forward to resolving these last remaining issues pertaining to the Sampling and Analysis Work Plan, and the subsequent implementation of Work Plan.

Sincerely,

Gary L. Nelson
Sr. Metallurgical Engineer
Hecla Mining Company

Attachments

Cc: Gary Gamble
John Galbavy, Esq.
John Jacus, Esq. (DGS Law)
Clint Strachan (SMI)

U590002
01-4

Attachment A

U590002
01-4

# MEMORANDUM

TO: Gary Nelson, Hecla Mining Company

FROM: Clint Strachan, Shepherd Miller, Inc.

DATE: March 2, 2001

SUBJECT: Apex Site, Shallow Well Installation

As you requested on March 2, this memorandum outlines our recommendations for re-evaluation of the analysis conducted by EPA for estimating the number of shallow wells to be installed on the perimeter of Pond 2 at the Apex site. This memorandum has been prepared for Hecla Mining Company (Hecla) by Shepherd Miller, Inc. (SMI).

## BACKGROUND

Installation of one or more shallow wells along the perimeter of Pond 2 has been discussed with EPA as the most likely method of assessing if leakage has taken place from Pond 2 into underlying materials. Since groundwater at the site has been measured in on-site wells at depths of over 150 feet, leakage from Pond 2 would not have reached groundwater and would most likely be in near-surface materials that are partially saturated. Installation of shallow wells at the contact between weathered sandstones and underlying siltstone has been proposed, in the event that leakage is of a large enough rate to perch (or create a zone of saturation) on the siltstone contact. This zone of saturation could be detected and sampled with a well.

In our conference call with EPA technical personnel on February 22, EPA agreed that shallow wells were the preferred approach for evaluation of leakage from Pond 2. EPA stated that the minimum number of wells would be three (one upgradient and two downgradient from Pond 2). EPA recommended that eight wells should be installed along the perimeter of Pond 2, consisting of one upgradient and seven downgradient wells. This number of wells was established by modeling conducted by EPA and summarized below.

## EPA WELL ESTIMATE MODELING

Mr. Randy Breeden (EPA's hydrogeologist) used a groundwater flow and chemical dispersion model to estimate the number of shallow wells to be installed along the perimeter of Pond 2. This model was based on the assumption that there was a shallow zone of saturation beneath Pond 2, and a leak from beneath the center of Pond 2 could be detected by a well located outside the perimeter of the pond.

Mr. Breeden had not seen the site-specific drill hole and well logs that Hecla had previously sent to EPA, so Mr. Breeden used assumed parameters in the model that are listed below.

| | |
|---|---|
| Flow path length | 250 feet |
| Longitudinal dispersivity coefficient | 30 meters |
| Transverse dispersivity coefficient | 0.3 meters |
| Hydraulic conductivity | 20 ft/day (73,000 ft/yr or $7.3 \times 10^{-2}$ cm/sec) |

Based on these parameters, seven wells evenly spaced along the perimeter of the downgradient side of Pond 2 would provide sufficiently small spacing to detect a leak. The well spacing 50 feet outside the toe of Pond 2 would be roughly 180 feet.

## COMMENTS ON EPA MODELING

If parameter values are adjusted to reflect actual site conditions, the modeling results above would show a wider well spacing and a lower number of wells. First, the ratio of longitudinal to transverse dispersivity coefficient used by Mr. Breeden is 30/0.3 or 100. Recommended values for this ratio for the weathered sandstones or siltstones at the site are roughly 10 (Freeze and Cherry, 1979; de Marsily, 1986). Second, the hydraulic conductivity used in the model (73,000 ft/yr) is typical of a clean gravel. A value of 100 ft/yr would better represent the weathered sandstones in the immediate area logged by SRK in 1983.

Using analytical dispersion calculations outlined in de Marsily (1986), the concentration 250 feet downgradient from a leak would be 1000 times higher using the dispersivity ratio of 10 and a hydraulic conductivity of 100 ft/yr than the assumed values used by EPA. This means that significantly more lateral dispersion would take place with the lower dispersivity ratio and lower hydraulic conductivity, resulting in a wider well spacing based on detection of a theoretical leak.

Prior to agreement with EPA on the number of shallow wells to be drilled around the perimeter of Pond 2, we recommend that EPA re-evaluate the well spacing with their model using the site-specific values given above.

01-4

Attachment B

# "Other" Metals Data

| Data Source | Sample Description | Analysis Description | Metals Analysis, mg/l | | | | |
|---|---|---|---|---|---|---|---|
| | | | Antimony | Beryllium | Thallium | Tin | Vanadium |
| 1 | Surge Pond (liquid) | Waste Sol'n Analysis | | <0.1 | | | 1.6 |
| | Pond #2A | Waste Sol'n Analysis | | <0.1 | | | 14.5 |
| | Pond #1C (composite) | Waste Sol'n Analysis | | <0.1 | | | 5.0 |
| | Pond 2A (liter bottle) | Leachate Analysis * | | <0.005 | | | 0.12 |
| | Pond 3B N (liter bottle) | Leachate Analysis * | | <0.05 | | | 1.2 |
| | Pond 3B S (liter bottle) | Leachate Analysis * | | <0.05 | | | 1.5 |
| | Pond 1C (liter bottle) | Leachate Analysis * | | <0.05 | | | 0.2 |
| | Pond 3B N (solids) | Leachate Analysis * | | <0.05 | | | 2.5 |
| | Pond 3B S (solids) | Leachate Analysis * | | <0.05 | | | 1.9 |
| | Pond 2A (liter bottle) | EP Toxicity Analysis | | <0.005 | | | <0.01 |
| | Pond 3B N (liter bottle) | EP Toxicity Analysis | | <0.03 | | | 0.35 |
| | Pond 3B S (liter bottle) | EP Toxicity Analysis | | <0.03 | | | 0.40 |
| | Pond 1C (liter bottle) | EP Toxicity Analysis | | <0.03 | | | 0.10 |
| | Pond 3B N | EP Toxicity Analysis | | <0.03 | | | 0.60 |
| | Pond 3B S | EP Toxicity Analysis | | <0.03 | | | 0.55 |
| | Pond #2A (composite) | EP Toxicity Analysis | | <0.03 | | | 0.55 |
| | Pond #2 Solution (composite) | Waste Sol'n Analysis | | <0.1 | | | 13.5 |
| | Pond #1C Sol'n Between Liner | Waste Sol'n Analysis | | <0.1 | | | 2.0 |
| | Pond 2 (liter bottle) | Leachate Analysis * | | <0.005 | | | 0.04 |
| | Pond 3A (liter bottle) | Leachate Analysis * | | <0.05 | | | 4.2 |
| | Pond 1B (liter bottle) | Leachate Analysis * | | <0.05 | | | 0.4 |
| | Pond 2 (liter bottle) | EP Toxicity Analysis | | <0.005 | | | <0.01 |
| | Pond 3A (liter bottle) | EP Toxicity Analysis | | <0.03 | | | 0.95 |
| | Pond 1B (liter bottle) | EP Toxicity Analysis | | <0.03 | | | 0.10 |
| | Pond 1C (composite) | EP Toxicity Analysis | | <0.03 | | | 0.05 |
| | Pond 3A (composite) | EP Toxicity Analysis | | <0.03 | | | 1.50 |
| | Pond #2 (composite) | EP Toxicity Analysis | | <0.03 | | | 0.15 |
| | Pond 1B (composite) | EP Toxicity Analysis | | <0.03 | | | 0.05 |
| 2 | Pond 3A Effluent (5/10/95) | | <1.0 | | | | <1.0 |
| 3 | Well ASW-2 (10/11/83) | | <0.01 | <0.01 | | | |
| | Well ASW-3 (10/11/83) | | <0.01 | <0.01 | | | |
| | Well 2 (10/27/88) | | <0.001 | <0.02 | 0.1 | | |
| | Well ASW-2 (12/16/88) | | 0.005 | <0.0001 | <0.1 | | |
| | Well ASW-3 (12/16/88) | | <0.001 | <0.0001 | <0.1 | | |
| | Well ASW-4 (12/16/88) | | 0.005 | <0.0001 | <0.1 | | |

Data Source Key

1 Data from 5/31/89 - ACZ Laboratories, Inc. - Waste Analysis Report

2 Attachment N - Information Request #6 - Tailings - Pond 3A Effluent and Neutralization - Cobalt

3 Attachment T - Information Request #6 - Analytical Report

* 24 Hr. 5:1 Water/Solid Shake Test Leachate Analysis

U590002
01-4

Attachment C

# TECHNICAL MEMORANDUM

TO: John Jacus, Davis Graham and Stubbs LLP

FROM: Clint Strachan, Shepherd Miller, Inc.

DATE: February 2, 2001

SUBJECT: Apex Plant Site, Groundwater Quality Data

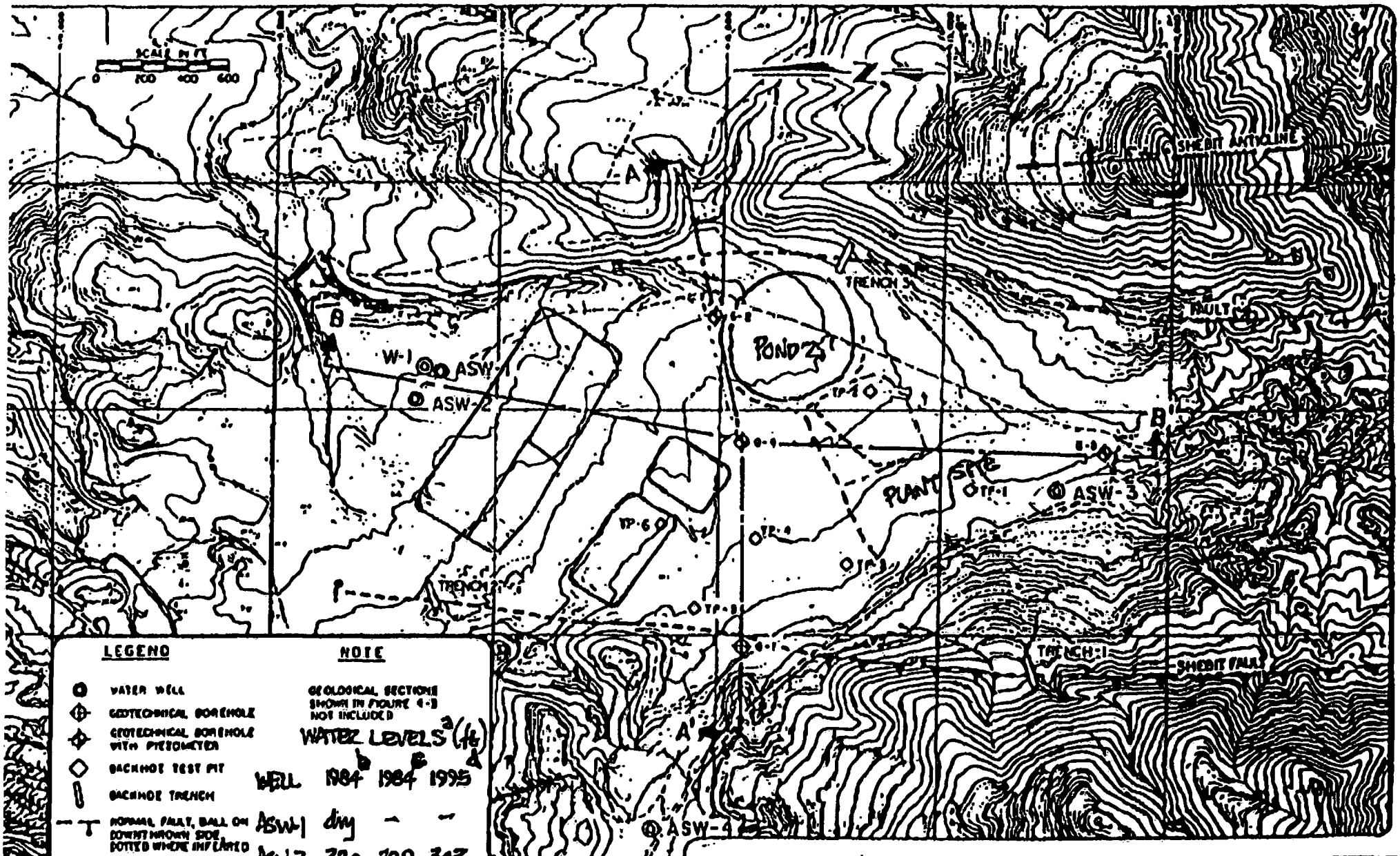
From our conference call with EPA on January 25, the presence is location of existing groundwater quality data was discussed. This memorandum outlines the location of existing data from information that has been submitted to EPA by Hecla.

**SRK (1984), groundwater supply report.** Four wells were drilled and completed in the site area in 1983 (ASW 1 through 4), with locations shown on the attached figure. The wells were installed for plant water supply purposes, but also represent groundwater conditions prior to plant construction and start-up. One well (ASW 1) was dry. Groundwater samples for water quality analyses were collected in 1983 immediately upon well completion and one or two times later. There was also one sampling episode early in 1984. Two of these episodes include an extensive list of inorganic parameters.

**Harr (1988), sampling episode.** One sample from well ASW 2 was collected by Bradley Harr and analyzed for an extensive list of organic parameters and metals.

**Kleinfelder (1995) well pump test report.** Pump and recovery tests were conducted for Hecla in June 1995 on wells ASW 2, ASW 3, and ASW 4 for water supply evaluation. Water quality samples were collected at the end of pumping from all three wells for analysis, but the analysis results are not included in the file copy of the report.

**OMG (1998), data summary.** OMG has a spreadsheet summarizing water quality analysis data for ASW 2, ASW 3, and ASW 4 from 1983 through 1998. Metals analysis results only are included in the spreadsheet.




**LEGEND**

- WATER WELL
- GEOTECHNICAL BOREHOLE
- GEOTECHNICAL BOREHOLE WITH PIEZOMETER
- BACKHOE TEST PIT
- BACKHOE TRENCH
- NORMAL FAULT, BALL ON DOWNTHROWN SIDE, DOTTED WHERE INFERRED
- REVERSE FAULT, DOTTED WHERE INFERRED

**NOTE**

GEOLOGICAL SECTIONS SHOWN IN FIGURE 4-3 NOT INCLUDED

WATER LEVELS[a] (ft)

| WELL | 1984[b] | 1984[c] | 1995[d] |
|---|---|---|---|
| ASW-1 | dry | – | – |
| ASW-2 | 330 | 299 | 303 |
| ASW-3 | 285 | 256 | 263 |
| ASW-4 | 195 | 161 | 165 |

[b] SRK (1984) at drilling
[d] Klienfelder (1995)
[c] SRK (1984) later
[a] Depth to static water level

| | |
|---|---|
| PROJECT NO. | 02903 |
| FUNCTION NO. | |
| REVISION NO. | |

PREPARED BY:
STEFFEN ROBERTSON & KIRSTEN
Consulting Engineers

# FIGURE 3-1

LOCATION OF SITE INVESTIGATION AND GEOLOGICAL SECTIONS

0290304-10